THE Vision THERAPY CENTER, INC.

Teacher/Parent Vision and Learning Guide

The information in this guide was created for teachers and parents. It provides background information on the vital connections between vision and learning.

You'll find the following information:

- Vision and Learning Overview
- What are some of the vision skills that affect learning?
- Impact on Subjects
- What does the work of someone with vision problems look like?
- Stress Points
- Take the Vision Quiz
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VISION AND LEARNING OVERVIEW

Good vision requires your eyesight, visual pathways, and brain to all work together. When they don't, even a person with 20/20 eyesight can experience difficulty reading, writing and processing information, as 80% of all information comes to a child through their vision.

Most people think that if a person's visual acuity is 20/20 their vision is 'normal' or 'perfect'. That's not the case.

Visual acuity is a measure of the clarity of a person's vision and is tested by having a patient read a line of letters on an eye chart. This test does not require the same amount and types of eye movements that reading does, so it cannot be used to determine whether a child has the visual skills necessary to read.

While clear vision is important, it is only one of many visual skills required to be able to read and learn.

- 75-90% of classroom learning comes through the visual system.
- 80% of children who are reading disabled, including dyslexics, have vision problems that can be solved.
- 25% of ALL children have a vision problem significant enough to affect their performance in school.
- 95% of first grade nonreaders had significant vision problems. They had nearly 2.5 times more visual problems than first grade high achievers.
- In one study, 70% of juvenile delinquents had a vision problem.
- In one California funded study, recidivism (repeat offenders) reduced from 45% to 16% when wards received on-site optometric vision therapy.
- When a group of illiterate adults were vision screened, there was a 74% failure rate.
- School vision screenings, such as a Snellen eyechart, detect only 20-30% of vision problems in schools.
- Only 13 percent of mothers with children younger than 2 years of age have taken their baby for a functional well-care eye exam. Yet 1 out 10 children are at risk for having an undiagnosed vision problem.

Source: Visionandlearning.org

WHAT ARE SOME OF THE SKILLS THAT AFFECT LEARNING?

Convergence

When reading, the eyes should aim inward at the same spot in order to fixate on print. If the eyes aim at a spot in front of or behind the print, extra energy and effort is required to maintain fixation and double or overlapping vision may occur. An example is shown to the left.

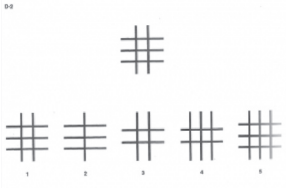
Directionality

b d p q

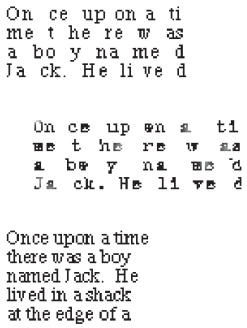
Directionality is important in understanding how similar shapes can have different meanings when they are in different orientations. To the left is an example of some letters that are commonly reversed by children with poor directionality. The letters are the exact same shape, but are called a different name depending on their orientation.

This can be a difficult concept because if another object, such as a chair, is turned on its side or upside-down it is still called a chair.

Form Perception



To the left is an example of an item from a visual perceptual skills test. In this particular test the child is asked to identify which form among the choices at the bottom matches the form on top. Other visual perceptual skills tests assess the child's ability to identify a form from memory, identify which form is oriented in a different direction, identify a form that has a different size or orientation, identify a sequence of forms from memory, identify a figure hidden in ground and identify an incomplete form as if it were complete.



Span of Recognition

Children who can read at accelerated speeds often have a good span of recognition, allowing them to recognize and process several words at one time. Children lacking this skill may only be able to see one word or letter at a time. In order to see what this would be like, try reading a sentence or paragraph while looking through a straw.

Visualization

Visualization is the ability to create mental images. Children who have vision problems may also have difficulty with visualization. This skill is important for success in many school subjects including spelling and math.

Tracking (Pursuits and Saccades)

Commonly referred to as 'tracking', maintaining fixation on a moving target (pursuits) or accurately switching fixation between two targets (saccades) are two types of eye movements that are essential for reading and learning.

An example of this is when your eyes reach the end of a line of print and have to accurately move from the end of that line to the beginning of the next line of print. Difficulty with these eye movements can cause a child to skip words or lose their place easily when reading.

IMPACT ON SUBJECTS

Considering 80% of the information you process comes through your visual system, it's not surprising that a vision problem can affect a number of different subjects. Here's a brief overview of how vision problems can manifest in various areas.

Reading

Vision problems affect reading in two significant ways:

- When a student is learning to read, a serious vision problem could reduce their ability to know what they are looking at and impact their ability to remember numbers and letters.
- When a student is reading to learn and has blurry or double vision, their ability to read for long periods of time and comprehend what they are reading can be severely reduced.

The ability to read and the ability to comprehend what is being read are two different things. Comprehending what is read is a visual process, and can be affected when the visual system is not working correctly. If a student sees words on the page as blurry or double, he or she has to use extra effort to keep the words single and clear and this can negatively impact comprehension.

Students with vision problems spend the majority of their time decoding words. Instead of reading fluidly and visualizing the words and the message as a whole, they focus on each specific word. This is a struggle, making it difficult to quickly process sections of text.

As a result, students will track text with their fingers. They'll read a slower pace and will have fluency issues. Their reading will be marred by repetitions, insertions, omissions and substitutions.

These reading problems are all too often misconstrued as laziness on the part of the student. They are not. They are simply symptomatic of a vision problem. When corrected, it's common for students to enjoy reading and no longer avoid it.

Math

If a student has difficulty seeing things as clear and single, they may have trouble seeing decimals and/or signs. An important skill in math is to organize what is being written and the student may have trouble lining things up and keeping their place if their visual skills are poor.

Laterality and directionality are also important concepts in math. If a student sees the orientation of numbers incorrectly, they will have difficulty completing the problem.

Students who lack visualization skills can often be found counting on their fingers or verbalizing sequences. Given enough time, they can generally compute an answer, but they tend to do poorly on timed tests. Awareness of numbers and what they mean as well as being able to visualize numbers and quantities, are critical to success in math and can be impacted if a child has a vision problem.

It should be noted that a child with vision problems may do well in math but be a poor reader, primarily because math doesn't require as many precise eye movements as reading.

Spelling

Visual recall, the ability to create a visual image based on past visual experience without currently having that experience, is a visualization skill that is critical for spelling. In spelling, it is the ability to create a mental image of a word without being able to look at the word.

Writing

Writing involves both handwriting and composition skills. It is necessary for vision to lead the hand for handwriting and this can be very difficult if the student cannot see well. In fact, often you can see in the handwriting where the student stopped looking or became fatigued. Difficulty writing straight on a page is often a result of poor peripheral awareness.

There are several vision-related skills that are critical to good handwriting that may be underdeveloped in a student with vision problems. Visualization is also important in handwriting because the student needs to remember what different words look like in order to reproduce them on the page. Spatial concepts are important in handwriting to know and plan how words will go together. Good laterality and directionality are important to differentiate similarly-shaped letters in different orientations (e.g. b, d, p, q).

Visualization is also critical for writing composition because the student needs to be able to organize and re-organize the composition in his or her head.

WHAT DOES THE WORK OF SOMEONE WITH VISION PROBLEMS LOOK LIKE?

Take a look at some of the samples of students with vision problems:

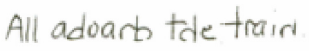
Unequal sized print

Words moving or letters running together

Words take off and leave the page

Double print

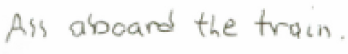
Reversed letters



Words squished together

Words appear as splotches or streaks

Words are shaky



STRESS POINTS

These are areas that can cause stress for students with vision problems:

- Small print
- Sustained, near point work
- Full pages of print, with blocks of text close together
- Copying from chalkboard or SMART Board to paper on desk
- Fine-motor skills
- Flickering fluorescent bulbs
- Standardized test sheets
- Random lists of spelling words
- Timed tests
- Crossword puzzles
- Reading aloud to a group without being given a warning
- Being asked to instantly identify right and left directions

TAKE THE VISION QUIZ

The Vision Quiz is the first step toward assessing if a student has a vision problem. Write in number that best describes how often each symptom occurs:

0=Never, 1=Seldom, 2=Occasionally, 3=Frequently, 4=Always

SYMPTOM	SCORE
Headaches from near work	
Words run together when reading	
Burning, itchy, watery eyes	
Skips/repeats lines when reading	
Head tilt/closes one eye when reading	
Difficulty copying from chalkboard/overhead	
Avoids near work/reading	
Omits small words when reading	
Writes uphill or downhill	
Misaligns digits/columns of numbers	
Reading comprehension down	
Holds reading material too close	
Trouble keeping attention on reading	
Difficulty completing assignments on time	
Always says "I can't" before trying	
Clumsy, knocks things over	
Does not use his/her time well	
Loses belongings/things	
Forgetful/poor memory	
TOTAL POINTS:	

A score of 20 or more points* indicates the need for a functional vision exam.

A functional vision exam tests the entire visual system, and is performed by a developmental optometrist. Based on these findings, it may be determined that vision therapy is required.

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VISION THERAPY

What is Vision Therapy?

Vision therapy helps the patient develop the visual skills necessary for good vision. Optical devices and exercises are used to retrain the muscles that control the eye in order to make eye movements easier and more efficient.

In addition to retraining the muscles, the patient learns how to correctly process the visual information that the brain receives from the eyes. Vision therapy can range from one session to 2-3 years and involves office visits combined with at-home activities. Most programs last from 6-9 months.

Who Needs Vision Therapy?

Patients who require vision therapy generally have the following visual challenges:

- **Learning related visual problems:** Conditions such as poor eye teaming, focusing, tracking and visualization skills can all negatively affect learning.
- **Crossed Eye (Strabismus) or Lazy Eye (Amblyopia):** Crossed eyes and/or lazy eyes can be treated with vision therapy instead of conventional surgery, glasses or patching. Vision therapy is very effective for these conditions at an early age, but can yield results for patients of any age.
- **Stress-induced vision problems:** Our high-tech society requires many people to do a large volume of near work in front of a computer screen. Because of this, there is an increasing number of patients that experience eyestrain, headaches and other visual related difficulties.
- **Visual rehabilitation for special populations (strokes, brain injuries, developmental delays, multiple sclerosis, etc.):** A neurological disorder or trauma to the nervous system can affect a person's vision. This includes people who have traumatic brain injuries, strokes, whiplash, developmental delays, cerebral palsy, multiple sclerosis, and other neurological ailments.
- **Sports vision improvement:** Even good vision can become better. Athletes often use vision therapy to improve eye-hand coordination, visual reaction time, peripheral awareness, eye teaming, focusing, tracking and visualization skills.

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What Outcomes Can You Expect?

When the eyes move, align, fixate and focus together, a whole new world of vision is discovered.

With successful treatment, our patients may find that:

- Learning becomes easier
- Reading level and speed increases
- Time spent on homework decreases
- The ability to follow moving objects (a ball, a car) improves
- Seeing objects nearby or at a distance improves
- Visualizing mental images becomes easier

The rate at which patients experience these improvements will vary, but generally progress is seen early in the therapy program.

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STUDIES

A Randomized Clinical Trial of Treatments for Convergence Insufficiency in Children

http://www.thevisiontherapycenter.com/wp-content/uploads/2009/11/randomizedClinicalTrialofTreatmentsforClinChildren.pdf

The National Eye Institute, a division of the National Institutes of Health for the U.S. Department of Health and Human Services, funded a study to determine the most effective treatment for Convergence Insufficiency.

This was a double-blind, masked study with **both optometrists and ophthalmologists** collaborating together. It involved nine sites throughout the U.S., including prestigious clinics such as the Mayo Clinic, Bascom Palmer Eye Institute, and the Ratner Children's Eye Center.

The authors of this clinical trial found that vision therapy/orthoptics was more effective than pencil push-ups (a visual exercise) or placebo vision therapy/orthoptics in reducing symptoms and improving signs of convergence insufficiency in children 9 to 18 years of age.

Research and Clinical Studies on Vision, Learning and Optometric Vision Therapy

http://www.thevisiontherapycenter.com/wp-content/uploads/2009/11/SummaryofResearchClinicalStudies.pdf

This paper presents over 350 abstracts from 77 different journals within the fields of education, optometry, ophthalmology, neurology and psychology. It includes all works relating to vision and learning, including papers that purport there is no relationship between vision and learning – of which there are only 15.

A Summary of Research and Clinical Studies on Vision and Learning

http://www.thevisiontherapycenter.com/wp-content/uploads/2009/11/SummaryofResearchonVisionandLearning.pdf

A listing of some of the research reports and clinical studies on the relationship of vision to reading and learning ability and the effectiveness of vision therapy in the treatment of learning-related vision problems.

The Scientific Basis for and Efficacy of Optometric Vision Therapy in Nonstrabismic Accommodative and Vergence Disorders

http://www.thevisiontherapycenter.com/wp-content/uploads/2009/11/Basis-for-efficacy-of-Optometric-VT-in-nonstrabismicaccomodate.pdf

This article focuses on the scientific basis for vision therapy. It reviews studies that used objective recording techniques in order to assess the impact of vision therapy on the oculomotor system.

MODIFICATIONS FOR THE CLASSROOM

To help children with vision issues, consider some of the following modifications. If the student needs vision therapy, be sure to communicate with the parents and the vision therapist to ensure the correct modifications are being made:

- Make larger print available.
- Allow for visual breaks during sustained near point work.
- Whenever possible, be sure learning materials are well-spaced and well-organized on the page.
- In the event that something needs to be copied from the board, move student closer to the chalkboard or place material to be copied on his/her desk.
- Provide "fat" pencils and crayons – use special pencil grips.
- Furnish a slanted reading and writing surface.
- If possible, make use of natural lighting and full spectrum bulbs.
- Provide highlighter markers to help with reading.
- Make more time available for timed tests.
- Allow students to have the option about reading aloud to a group.
- Allow for kinesthetic learning.
- Allow students to verbally give answers to tests.

The Vision Therapy Center, Inc.

To read our success stories and
for more information, visit
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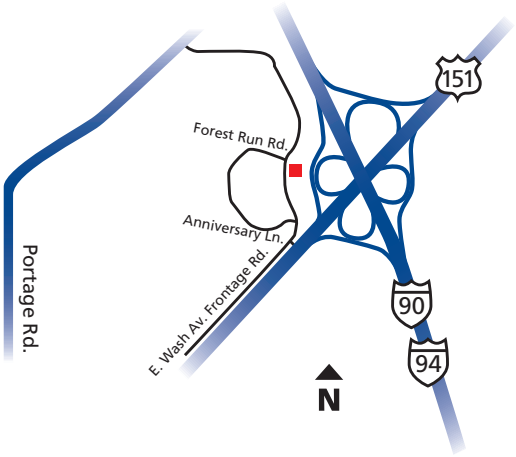

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